CLAIMS

What is claimed is:

1. A start-up automatic frequency control (AFC) method used during initial cell search (ICS) processing by a user equipment (UE) receiver, where the ICS comprises Step 1 processing of a given sequence, the method comprising:

a) receiving said sequence;

b) rotating a phase of the sequence;

c) correlating a primary synchronization channel (PSCH) sequence with the rotated phase of the received sequence and an unrotated phase of the received sequence; and

d) integrating the two correlations of step (c),

whereby the AFC start-up method is performed in parallel with the Step 1 sequence processing.

2. The method of Claim 8 wherein the given sequence is a primary synchronization code (PSC) sequence.

3. The method of Claim 1 further comprising repeating steps (b) to (d) a given number of times.

4. The method of Claim 3 wherein steps (b) to (d) are preferably repeated twenty-four (24) times.

5. A system for performing start-up AGC during initial cell search (ICS) by a user equipment (UE) receiver, where the ICS comprises Step 1 processing of a given sequence, comprising:

a first correlator for receiving a first stored sequence of the primary synchronization channel;

a second correlator for receiving a second stored sequence of the primary synchronization channel;

an error estimator for determining the error associated with the outputs of the first and second correlators;

a filter for selectively integrating the error estimate responsive to an initial or steady state conditions of the cell search process; and

one of a voltage controlled oscillator (VCO) and numeric controlled oscillator (NCO) for adjusting frequency responsive to the integrated error estimate.

6. The system of Claim 5 wherein the given sequence is a primary synchronization code (PSC) sequence.

7. The system of Claim 5 wherein the filter is a PI filter.

8. The system of Claim 5 wherein said filter is a digital filter having a delay element of $1/(1-z^{-1})$.

9. The method of claim 1 wherein:

a received input power level is adjusted prior to steps (a) to (d).

10. The method of claim 9 wherein the input is digitized after adjustment of the power level.

11. The method of claim 9 wherein the power level is set employing open loop gain control.

12. The method of claim 1 wherein the step of ICS processing includes:

obtaining the primary synchronization code (PSC).

13. The method of claim 12 further comprising:

employing the PSC to extract the secondary synchronization code (SSC) from the received input.

14. The method of claim 13 wherein the received PSC and SSC are utilized to extract a midamble portion from the received input.

15. The method of claim 14 wherein a midamble having a highest energy is selected from the extracted midamble portion.

16. The method of claim 1 wherein a periodic cell search is conducted to obtain a best base station during a given period.

17. The method of claim 1 wherein the frequency adjustment is numerically controlled.

18. The method of claim 1 wherein the frequency adjustment is voltage controlled.

19. The method of claim 1 wherein the Step 1 processing is repeated every N1 frames where N is a real integer and $N \geq 1$.

20. A method for adjusting frequency during an initial cell search in a wireless network, comprising:

a) obtaining a synchronization code responsive to a received input containing a sequence;

b) rotating a phase of the sequence;

c) correlating a primary synchronization channel (PSCH) sequence with the rotated phase of the received sequence and an unrotated phase of the received sequence; and

d) integrating the two correlations of step (c),

whereby the AFC start-up method is performed in parallel with step (a).